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DWARFMISTLETOE SURVEY IN KOOTENAI NATIONAL FOREST

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METHOD

A roadside survey to determine the distribution and abundance of dwarfmistletoes (Arceuthobium spp.) in the Kootenai National Forest was made in 1957. Intermingled and adjacent alienated lands were included. This roadside reconnaissance consisted of traveling a major portion of the forest roads (from 65 to 90 percent of the passable roads in every ranger district) at about 10 miles per hour, recording location and intensity of infection, and making frequent stops to examine the stands.

All species of trees were examined for dwarfmistletoe infection, but detailed information from this roadside survey was recorded only for western larch (Larix occidentalis Nutt.). Whenever dwarfmistletoe was encountered in lodgepole pine (Pinus contorta Dougl.) or other coniferous species, the approximate location and extent of the infected area were recorded on an outline map (fig. 1).

During travel through stands containing 10 percent or more of western larch, the following information was recorded:

Degree of dwarfmistletoe infection

Free	Stand free of dwarfmistletoe.
Light	Less than one-third of the trees infected.
Moderate	One-third to two-thirds of the trees infected.
Heavy	More than two-thirds of the trees infected.

Type of stand

Nonmerchantable

Class I	Even-aged stands of saplings or small poles with no overstory.
Class II	Even-aged stands of large poles with no overstory.

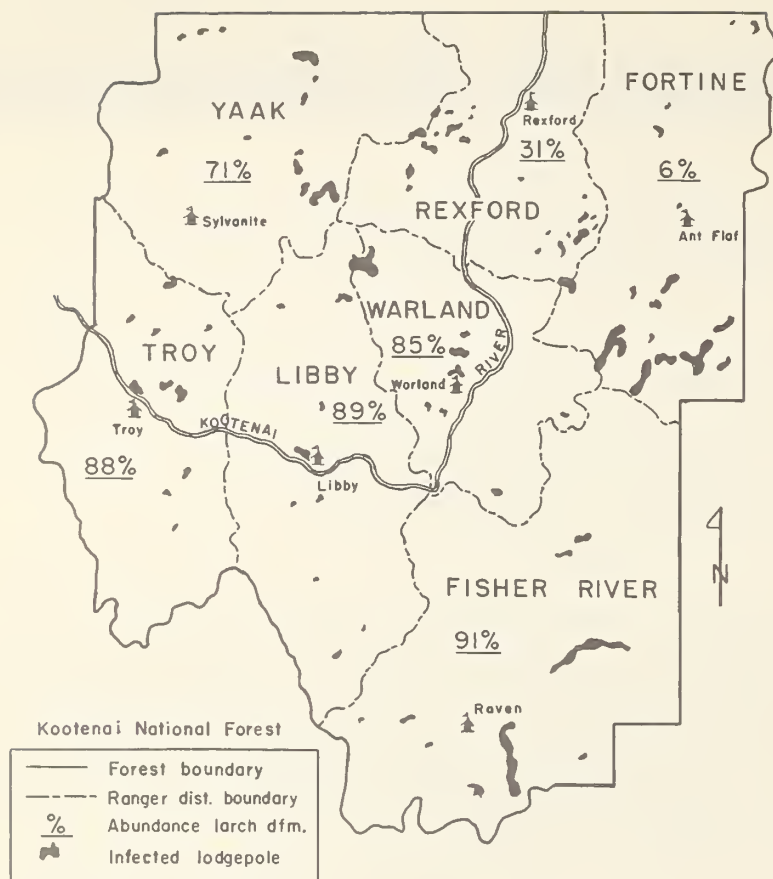


Figure 1.--Abundance of western larch dwarf-mistletoe and location of infected lodgepole pine stands in the Kootenai National Forest as determined from roadside survey in 1957.

Merchantable

Class III	Mature or virgin stands.
Class IV	Regenerated partial burns with overstory of fire residuals.
Class V	Cutover stands with overstory of cutting residuals.

Stand composition

Low	Stands having 10 percent but less than 25 percent western larch.
Medium	Stands having 25 to 50 percent western larch.
High	Stands having more than 50 percent western larch.

Observations were made on a continuous strip, one or one-half chain wide depending on stand density, along the right-hand side of the road. Odometer readings were noted and distances recorded to the nearest one-tenth mile whenever a change occurred in one of the conditions listed above. This gave a distance of one-tenth mile as the basic unit on which the extent and degree of larch dwarfmistletoe infection were recorded. In merchantable stands having two stories, the degree of infection in the understory was recorded separately from that in the overstory.

RESULTS AND DISCUSSION

Abundance of larch dwarfmistletoe in each ranger district was determined from the roadside survey (fig. 1 and table 1). A total of 893.7 miles of roadside strip was traveled in western larch stands. Dwarfmistletoe was

Table 1.--Incidence of dwarfmistletoe in western larch stands by degree of infection, Kootenai National Forest, 1957^{1/}

	:	: Proportion of total miles traveled in western				
	: Total	: larch stands, by degree of infection				
Ranger	: miles of	: Dwarfmistletoe infected miles			:	Dwarf-
district	: roadside	: strip			:	mistletoe-
	:	Light	Moderate	Heavy	Total	free miles
	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Fisher River	198.7	14	32	45	91	9
Libby	138.2	18	21	50	89	11
Troy	113.0	12	19	57	88	12
Warland	130.8	10	25	50	85	15
Yaak	105.3	17	19	35	71	29
Rexford	109.1	10	7	14	31	69
Fortine	98.6	5	1	<1	6	94
All districts	893.7	12	20	38	70	30

^{1/} Includes intermingled and adjacent alienated lands.

found along 630.1 miles, or in about 70 percent of these stands. Incidence of dwarfmistletoe was approximately equal in the Fisher River, Libby, Troy, and Warland Ranger Districts, and in most of the Yaak District. Total infection in the Yaak District was somewhat less than that in the other four districts because several stands in the northeast quarter of the district were dwarfmistletoe-free. Abundance of dwarfmistletoe was moderate in the Rexford District (31 percent) but very light in the Fortine District (6 percent). Heavy damage, i.e., stands having more than two-thirds of the stems infected, occurred in more than one-half of the infected stands.

No great variation in the incidence of infection was evident in the overstory of different types of merchantable stands. On any given ranger district, infection was about as common in mature stands as in stands having an overstory of merchantable trees left by fire or cutting (table 2). The frequency of dwarfmistletoe in nonmerchantable stands of large poles was four times that in stands of small poles and saplings. However, this incidence of dwarfmistletoe in nonmerchantable stands having no overstory was less than that in the understory of merchantable stands. Infection in the understory of merchantable stands was 5.8 times as frequent as in stands of small poles and saplings, and 1.4 times as frequent as in stands of large poles.

Table 2.--Abundance of western larch dwarfmistletoe in different types of stands, Kootenai National Forest, 1957

Ranger district	Incidence of larch dwarfmistletoe by various types of stands ^{1/}					
	Nonmerchantable stands (no overstory):			Merchantable stands		
				Overstory	Understory	
	Class I	Class II	Class III	Class IV	Class V	Classes
	(small poles & saplings)	(large poles)	(mature)	(fire resid-uals)	(cut-over)	III, IV, & V
	Percent	Percent	Percent	Percent	Percent	Percent
Fisher River	0	29	98	99	99	59
Libby	13	91	95	97	95	75
Troy	35	82	98	100	100	92
Warland	8	71	93	99	96	85
Yaak	8	42	83	90	85	67
Rexford	0	13	46	21	31	32
Fortine	0	2	9	15	2	6
All districts	11	47	78	85	78	64

^{1/} Based on the distance traveled in infected stands expressed as a percentage of the total distance traveled in each type of stand.

Abundance of larch dwarfmistletoe was not correlated with the amount of larch present in the stand (table 3). Infection was as common in stands containing only a few larch as in stands having a moderate or high percentage of it.

Table 3.--Abundance of western larch dwarfmistletoe in stands having low, medium, and high composition of larch, Kootenai National Forest, 1957

Ranger district	Incidence of larch dwarfmistletoe by composition classes ^{1/}			
	Low	Medium	High	All
	Percent	Percent	Percent	Percent
	Percent	Percent	Percent	Percent
Fisher River	86	93	94	91
Libby	87	89	91	89
Troy	88	89	87	88
Warland	86	87	81	85
Yaak	79	68	69	71
Rexford	17	36	41	31
Fortine	0	8	9	6
All districts	69	70	72	70

^{1/} Based on the distance traveled in infected stands expressed as a percentage of the total distance traveled in each composition class.

Lodgepole pine dwarfmistletoe was found generally distributed throughout the forest. Several infected stands were mapped in each district (fig. 1). In view of the increased utilization of lodgepole pine and of observations on the widespread occurrence of dwarfmistletoe, the need for management of this species to reduce dwarfmistletoe losses is evident.

Dwarfmistletoe appears to be no problem in species other than western larch and lodgepole pine. One stand of infected Douglas-fir was found in the Troy District near the south end of Kilbrennan Lake. One other area that may be infected lies along Purcell Ridge in the Libby District. No ponderosa pine infected with its specific dwarfmistletoe was found.

SUMMARY

To determine abundance of dwarfmistletoes in the Kootenai National Forest, a roadside survey was made on all ranger districts in 1957. Dwarfmistletoe was found in approximately 70 percent of all larch stands traversed. Except in the Fortine and Rexford Districts and the northeastern part of the Yaak District, where infection was only light to moderate, more than 85 percent of all larch stand units examined were infected.

No difference was found in the abundance of larch dwarfmistletoe either in the overstory of mature stands, cutover stands, or stands of fire residuals, or in low, medium, and high percentages of larch. However, the abundance of dwarfmistletoe in the young understory of merchantable stands was 5.8 times greater than in even-aged stands of small poles and saplings having no overstory, and 1.4 times that in large pole-sized trees having no overstory.

Infected lodgepole pine stands were found throughout the forest.

